

Appl. No. 09/778,922

REMARKS

Claims 1-20 and 22 are pending in this application. Claims 18 and 22 have been canceled without prejudice or disclaimer of the subject matter contained therein. Claims 1 and 13 have been amended to further define the positioning of the straight guide vanes. Support for the amendment may be found at page 8, lines 13-17 of the Specification and in Figures 2 and 3. A number of the claims have also been amended to remove reference numerals. No new matter has been added.

1. Claim Objections

Claim 22 has been objected to under 37 C.F.R. §1.75(c) as being in improper dependent form for failing to further limit the subject matter of the preceding claim. Applicant has canceled claim 22 thereby obviating the objection. Reconsideration and removal of the objection is respectfully requested.

2. Claim Rejections under 35 U.S.C. §112, second paragraph

The Examiner has rejected claim 18 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Specifically, the Examiner states that claim 15 is indefinite because the expression "said cyclone chamber" lacks proper antecedent basis in claim 13. Claim 18 has been canceled thereby obviating the rejection. Reconsideration and removal of the rejection is respectfully requested.

3. Claim Rejections under 35 U.S.C. §103(a)

The Examiner has rejected claims 1-20 and 22 under 35 U.S.C. §103(a) as being unpatentable over Davenport et al. (U.S. Patent No. 2,553,175) in view of Klug (DE 914701). The Examiner argues that Davenport discloses a process and apparatus for separating solid particles from a gaseous stream. The Examiner acknowledges that the Davenport reference fails

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to disclose several features of the present invention including the guide vanes. However, the Examiner argues that the secondary reference, Klug, discloses "guide vanes in a cyclonic separator" and that it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to have modified the process and apparatus of Davenport to include the guide vanes of Klug to achieve efficient separation of solids from gas. With respect to the other missing elements, e.g. the treatment of the gaseous stream obtained from a secondary separator apparatus, the claimed source of the gas streams of claims 7 and 9, the dust concentration of claim 10 and the connection of the separator to a fluidized catalytic process apparatus, the Examiner maintains that these features would be apparent to the skilled artisan. Applicant respectfully disagrees.

As the Examiner will note, Applicant has amended the claims to include an additional feature. Specifically, the claimed apparatus used in the instant process now further specifies that the straight guide vanes are located on the outside of the multicyclone's separation chamber. This arrangement results in superior separation effectiveness as disclosed on page 8, lines 13-18 of the Specification and distinguishes the present invention over the proposed combination of Davenport and Klug. Applicant would point out that the proposed combination of Davenport and Klug disclose the placement of the alleged "guide vanes" inside of the cyclone chamber. Thus, the proposed combination does not teach the invention as presently claimed. Furthermore, Applicant submits that the proposed combination of Davenport/Klug would not render the present invention obvious, as there is no disclosure or suggestion within either of these references to place the "guide vanes" outside of the cyclone chamber.

Moreover, Applicant submits that the arrangement of the guide vanes described by Davenport/Klug would not achieve the same rate of separation efficiency as the presently claimed arrangement because the location of the guide vanes within the cyclone chamber of the Davenport/Klug apparatus would negatively impact flow dynamics. This would be apparent to a person of ordinary skill in the art. After the vanes, the tangential flow rate would be good but the velocity would suddenly decrease when the flow enters the cyclone chamber of the Davenport/Klug apparatus because the cyclone chamber has a greater diameter. In other words,

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the dynamic pressure would drop while the static pressure would increase. Retardation of the flow would give rise to a gas flow (i.e. a "returning or recycling flow whirl") from the point of the highest static pressure towards the point of the lowest static pressure. This point of recycling flow whirl is located below the vanes, which means that it, in practice, would transport back solid material which has been separated on the cyclone wall to the inflow of the cyclone. The flow would become uneven and turbulent which makes the separation efficiency of the Davenport/Klug combination rather poor. In contrast, the arrangement of the guide vanes outside the cyclone chamber results in an even and controlled flow. Thus, the separation efficiency of the claimed invention would be better than that achieved in the Davenport/Klug device.

In view of the foregoing remarks, Applicant submits that the presently claimed invention is both novel and non-obvious over the prior art. The Davenport and Klug references, either singly or in combination, simply fail to render the present invention obvious. Accordingly, reconsideration and removal of the obviousness rejection is respectfully requested.

Favorable consideration and early allowance of all the claims is requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Leonard R. Svensson (Reg. No. 30, 330) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to the provisions of 37 C.F.R. § 1.17 and 1.136(a), Applicant hereby petition for an extension of three (3) months to July 28, 2004 for the period in which to file a response to the Office Action dated January 28, 2004.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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